

## POOL OF TOPICS FOR DIFFERENT DISCIPLINES/SUBJECT

Subject/Discipline	Topic
<b>Geology +</b>	<ol style="list-style-type: none"> <li>1. Geological work of glacier and features developed during its work</li> <li>2. Magmatic differentiation</li> <li>3. Different type of classifications of igneous rocks</li> <li>4. Plate tectonics</li> <li>5. Magnitude of earthquake and its relation with energy released</li> <li>6. Intensity of earthquake and different intensity scale</li> <li>7. Processes of formation of economic deposit</li> <li>8. Distribution of Coal &amp; Petroleum deposit in India</li> <li>9. Origin of Coal &amp; Petroleum</li> <li>10. Geological Time Scale/Standard stratigraphic column</li> </ol>
<b>Mechanical +</b>	<ol style="list-style-type: none"> <li>1. DEVELOPMENTS OF BOUNDARY LAYERS</li> <li>2. HYDRAULIC MACHINES</li> <li>3. IMPORTANCE OF SOLAR ENEGY</li> <li>4. STEAM TURBINES</li> <li>5. DESIGN OF THERMAL POWER PLANTS</li> <li>6. BEARING DESIGN</li> <li>7. COMPOSITE MATERIALS</li> <li>8. DEVELOPMENTS OF SOLAR POWERED AEROPLANES</li> <li>9. ADVANCES IN WELDING</li> </ol>
<b>Production +</b>	<ol style="list-style-type: none"> <li>1. CPM AND PERT ANALYSIS</li> <li>2. DYNAMIC PROGRAMMING</li> <li>3. VARIOUS PRODUCTION PROCESSES</li> <li>4. AUTOMATION</li> <li>5. HUMAN RESOURCE MANAGEMENT FOR PRODUCTION</li> <li>6. UNCONVENTIONAL MACHINING</li> <li>7. INVENTORY CONTROL</li> <li>8. SCOPE OF PRODUCTION ENGG</li> <li>9. HONEYING AND LAPPING PROCESSES</li> <li>10. IMPORTANCE OF WORKSHOP</li> </ol>
<b>Instrumentation +</b>	<ol style="list-style-type: none"> <li>1. Transient response of RL, RC and RLC Circuits</li> <li>2. 8051 MICRO CONTROLLER</li> <li>3. MOSFET- structure, operation, characteristics</li> <li>4. D/A converter (R- 2R ladder and weighted resistor types),</li> <li>5. Electrodynamometer type wattmeter</li> <li>6. Linear Variable Differential Transformer (LVDT)</li> <li>7. Bode plot</li> <li>8. Switched mode regulators- Buck, boost, buck- boost converter</li> <li>9. pH Measurement</li> <li>10. Measurement of blood pressure</li> </ol>

<p><b>Chemical +</b></p>	<ol style="list-style-type: none"> <li>1. Distillation &amp; its application</li> <li>2. Corrosion control</li> <li>3. Process pumps ,Pipe fittings and joints</li> <li>4. Non-Conventional energy</li> <li>5. Regulations on the discharge of industrial pollution</li> <li>6. Approach to Air Pollution Control</li> <li>7. Fluidization and its industrial application</li> <li>8. Industrial Waste water treatment</li> <li>9. Instrumentation in a Chemical process industry</li> <li>10. Polymer processing/ fabrications</li> </ol>
<p><b>Civil +</b></p>	<ol style="list-style-type: none"> <li>1. <b>Flow through pipes:</b> Losses in pipes flow-major loss (Loss due to friction) Darcy Weisbach equation, minor losses, Hydraulic gradient lines, Total Energy lines. Pipes in series, pipes in parallel, equivalent pipe, Siphon.</li> <li>2. <b>Collection, Conveyance and Distribution of water:</b> Intakes, Methods of distributions and supply, Methods for layout, Pressure requirements, Power requirements of pumps, Design of distribution systems.</li> <li>3. <b>Pavement analysis and design,</b> types of pavements, design factors, design methods, reliability. Relevant IRC and IS codes.</li> <li>4. <b>Wastewater Treatment:</b> Unit operation and process, Method of treatment, Preliminary treatment, Primary treatment, Secondary treatment.</li> <li>5. <b>Shallow and Deep foundations,</b> bearing capacity and settlement calculations.</li> <li>6. <b>Runoff</b> - The component of runoff, hydrograph, hydrograph separation, factors affecting runoff, unit hydrograph concept, derivation of unit hydrograph, Estimation of peak discharge by Rational Method</li> <li>7. <b>Rapidly varied flow:</b> Analysis of hydraulic jump, Flow over weir and spillways, Flow under sluice gate, brink depth.</li> <li>8. <b>Prestressed Concrete</b> – Concept, IS code requirements (IS: 1343) systems of prestressing, losses, simple design Concept of Design of end blocks, Magnate and Battens method.</li> <li>9. <b>Concrete Mix Design:</b> Basic consideration – cost, workability, strength and durability, grading, method of mix design, acceptance criteria for concrete.</li> <li>10. <b>Principles of Surveying,</b> Types of surveying, Chain and compass survey, Theodolite Traversing, Accuracy and errors,</li> </ol>
<p><b>Computer Science +</b></p>	<ol style="list-style-type: none"> <li>1. Array as a data structure</li> <li>2. B-tree and B+ tree - utility similarities and differences</li> <li>3. Garbage collection and compaction - strategies</li> <li>4. Dynamic programming as a tool for algorithm design</li> </ol>

	<ol style="list-style-type: none"> <li>5. Non-equivalence of DPDA and NPDA - reasons</li> <li>6. User space and kernel space for execution</li> <li>7. Memory management strategies</li> <li>8. Control unit design techniques</li> <li>9. Transaction serializability</li> <li>10. Turing Machine as universal acceptor</li> </ol>
<b>Electrical +</b>	<ol style="list-style-type: none"> <li>1. Power System dynamics and Stability</li> <li>2. Load Flow Studies</li> <li>3. Power Quality</li> <li>4. Power System protection</li> <li>5. Thyristor control of DC drives</li> <li>6. Synchronous machines</li> <li>7. Applications of Microprocessor and Micro-controllers in Speed control of motors</li> <li>8. Microprocessor Architectures and Efficiency</li> <li>9. Nonlinear Control System</li> <li>10. Digital Logic Design: Static vs. Dynamic Logic</li> </ol>
<b>Electronics+</b>	<ol style="list-style-type: none"> <li>1. Analog circuit Design</li> <li>2. Solid State Devices</li> <li>3. Signal and Systems</li> <li>4. Communication System</li> <li>5. Electromagnetic Wave and Propagation</li> <li>6. Wireless and Mobile Communication System</li> <li>7. Pulse and Digital Electronics</li> <li>8. VLSI Design</li> <li>9. Microwave Engineering</li> <li>10. Network Theories</li> </ol>
<b>English+</b>	<ol style="list-style-type: none"> <li>1. Transition from Modern to Post-modern Literature in English</li> <li>2. Modernism in the vernacular literature</li> <li>3. Adaptation of the 'mythological' into popular culture</li> <li>4. The Elizabethan age and Shakespeare</li> <li>5. Shakespeare's modern/contemporary adaptations</li> <li>6. Indian Writing in English</li> <li>7. History of English as a discipline</li> <li>8. Evolution of the Epic OR Novel OR Tragedy as a genre</li> <li>9. Translation: Indian writing into English OR English lit. into vernacular languages</li> <li>10. The Postcolonial and the English Literary Canon</li> </ol>
<b>Food Technology</b>	<ol style="list-style-type: none"> <li>1. Functional and Nutraceutical Foods.</li> <li>2. Edible and intelligent food packaging system.</li> <li>3. Green Food Processing.</li> <li>4. Novel encapsulation techniques' as delivery system.</li> <li>5. Modeling and Simulation of Food Processing Technologies</li> <li>6. Thermal Processing of Foods.</li> <li>7. Biodegradable Packaging</li> <li>8. Biosensors</li> <li>9. Ready to Eat Food Products</li> <li>10. Foods Laws</li> </ol>

<p><b>Mathematics</b></p>	<ol style="list-style-type: none"> <li>1. Partial Differential Equation</li> <li>2. Fourier Series</li> <li>3. Radius of Curvature</li> <li>4. Partial Differentiation</li> <li>5. Probability distribution</li> <li>6. Solution of system of linear equations</li> <li>7. Solution of differential equation by Runge-Kutta Method</li> <li>8. Successive Differentiation</li> <li>9. Finite Difference method</li> <li>10. Fourier Transformation</li> </ol>
<p><b>Physics</b></p>	<ol style="list-style-type: none"> <li>1. Wave-particle duality</li> <li>2. Coupled oscillation and normal modes</li> <li>3. Maxwell's equation and modification of Ampere's circuital law, Maxwell's equation in matter</li> <li>4. Newton's ring</li> <li>5. Heisenberg Uncertainty principle and its application</li> <li>6. Canonical transformation</li> <li>7. Semi empirical mass formula</li> <li>8. Binding energy curve explanation</li> <li>9. Working mechanism of LASER, application of LASER</li> <li>10. Bose-Einstein and Fermi-Dirac statistics, BE Condensation</li> </ol>
<p><b>Chemistry</b></p>	<ol style="list-style-type: none"> <li>1. Nanomaterials</li> <li>2. Corrosion Science</li> <li>3. Water and its treatment</li> <li>4. Surface/adsorption Science</li> <li>5. Fuels</li> <li>6. Air pollution</li> <li>7. Conducting polymers</li> <li>8. Lubricants</li> <li>9. Stereo chemistry and reaction mechanisms</li> <li>10. Studies on classification of organic reactions and their mechanisms</li> </ol>

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